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REMARKS

Applicant thanks the examiner for the indication of allowable subject matter as claimed in former claims 5 and 12.

In this Amendment claims 1, 8, and 10 have been amended to more particularly point out and more distinctly claim the subject matter that the applicant regards as his invention. Claims 5 and 12, each of which was found to be directed to allowable subject matter, have been rewritten in independent form to include all of the limitations of the respective base claims, and thus claims 5, 12, and 13 are now in allowable form.

Claim 10 was objected to on the ground it did not further limit independent claim 8 in that it only contained a method of use recitation. Accordingly, claim 10 has been amended to recite apparatus in means plus function form, and as so amended it is now believed clearly to further limit the subject matter claimed in claim 8.

Apparatus claims 8-11, 13, and 14 were rejected as anticipated by the Ritter et al. '650 reference. The present invention is directed to a strip material cooling method and apparatus, whereby the material is not cooled as it travels in a straight line, which requires considerable linear space. Instead, the present invention provides a more compact, space-saving method and arrangement in which the material is wound around a cooling drum, as a result of which it traverses a curved path that involves less linear space. But the curvature of the path is such as not to adversely mechanically influence the product by plastic deformation during the cooling process. Accordingly, the cooling drum has a

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diameter that exceeds the drum diameter or curvature at which the product is adversely mechanically influenced.

The Ritter et al. reference is directed to a strip material heat treatment and cooling method and apparatus that includes a drum and one or more tension rollers. The tension rollers are basically idler rollers, the position of which relative to the drum is regulated in order to control the tension in the material as it is either heated or cooled and winds around both the drum and the tension rollers. The purpose of the tension control is "to eliminate the danger that the wire will break in the event of either a deliberate interruption in operation or one caused by a fault." (see Ritter et al., col. 1, lines 58-60). The tension roller position relative to the drum is changed so that the tension in the material is relieved when it is sensed that the material tension exceeds a particular value (see Ritter et al., col. 2, lines 13-16) and "so that the thermal stability of the wire 18 is not exceeded and it is possible for the wire to contract, without breaking, in the event of sudden cooling" (Ritter et al., col. 3, lines 25-28). In that context, the phrase "thermal stability of the wire" means that the wire will not rupture due to excessive tension.

Additionally, as shown in the Ritter et al. drawings, the tension rollers have a significantly smaller diameter than that of the drum about which the material passes. The material passing around the tension rollers consequently traverses a curved path that has a significantly smaller diameter than that portion of the material that is wound on the drum. And by virtue of that smaller diameter curved path the material undergoes considerable bending. Apparently, such

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bending is not of importance in a heat treating phase, where the material undergoes an annealing process, which essentially reduces the stress levels within the material and serves to relax the material so that the degree of bending is of no consequence, because the material is at the annealing temperature.

Significantly, the Ritter et al. reference makes no mention whatsoever of mechanical influences on the product due to plastic deformation in a cooling process. It thus is directed to a different problem, one involving a different process and different apparatus. Furthermore, the reference to wire cooling in claim 15 of the Ritter et al. reference makes no mention of drum or tension roller diameter, nor does the specification. And as earlier noted, the tension rollers have a much smaller diameter than that of the drum, which would mechanically influence the cooling material by plastic deformation.

Claim 8 has been amended to clarify that the apparatus includes means for maintaining the cooling material in a curved path, in which the diameter of the curved path is greater than a diameter at which the product is influenced mechanically by plastic deformation. The Ritter et al. reference does not show or suggest any limitation whatsoever of the diameter of the curved path over which the material travels, nor does it even appreciate the adverse consequences that would ensue from the use of the small diameter tension rollers during a cooling process. Thus, the Ritter et al. reference does not anticipate the invention as it is claimed in amended claim 8.

Claims 9-11, and 14 each depend from claim 8, either directly or indirectly, and therefore the same distinctions as are noted above in connection with claim

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8 apply with equal effect to those dependent claims. Further, the dependent claims contain additional recitations that further distinguish the invention as so claimed from the disclosure of the Ritter et al. reference.

Claims 1-4, 6-11, 13, and 14 were rejected as obvious based upon the combination of the Ritter et al. reference and the disclosure of the present specification. With regard to paragraph [0004] of the present specification, that paragraph shows that the prior art teaches essentially straight cooling paths. But it does not show or even suggest that cooling of strip materials can be practiced as the material traverses a curved path that has a diameter that is greater than a diameter at which the product is influenced mechanically by plastic deformation. It leads one skilled in the art to utilize a linear material path during cooling, not a curved material path. Additionally, as noted above, the Ritter et al. reference also does not disclose a particular curved path diameter.

Claim 1 has been amended to recite the step of maintaining the cooling product within a curved path that has a diameter that is greater than the diameter at which the product is influenced mechanically by plastic deformation. Again, as noted above the Ritter et al. reference makes no mention whatsoever of mechanical influences on the product due to plastic deformation in a cooling process should the material traverse a curved path. Nor does it teach or suggest a particular curved path diameter to avoid adverse mechanical influences resulting from plastic deformation. And because neither the Ritter et al. reference nor the disclosure in the Background of the Invention section of the present specification teaches or suggests a particular curved path diameter, their

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combination also does not teach or suggest that limitation. Thus, the invention as it is claimed in amended claim 1 is not obvious thereover.

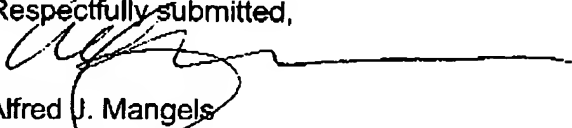
Claims 2-4, 6-11, 13, and 14 depend from a respective one of amended claims 1 or 8, either directly or indirectly, and therefore the same distinctions as are noted above in connection with claims 1 and 8 apply with equal effect to those dependent claims. Further, the dependent claims contain additional recitations that further distinguish the invention as so claimed from the teachings of the references relied upon.

Based upon the foregoing amendments and remarks, the claims as they now stand in the application are believed clearly to be allowable in that they patentably distinguish over the disclosures contained in the references that were cited and relied upon by the examiner, whether those references be considered in the context of 35 U.S.C. § 102 or of 35 U.S.C. § 103. Consequently, this application is believed to be in condition for allowance, and reconsideration and reexamination of the application is respectfully requested with a view toward the issuance of an early Notice of Allowance.

The examiner is cordially invited to telephone the undersigned attorney if this amendment raises any questions, so that any such question can be quickly resolved in order that the present application can proceed toward allowance.

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Respectfully submitted,



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